

## **Estimating Mortgage Default and Prepayment Risks**

Mortgage lending, then, can play an important role in promoting energy efficiency. For this reason, it is important to understand the risks inherent in such lending. Fortunately, many insights have been gained from a large number of mortgage termination studies that can be applied to better understand the relationship between energy efficiency and risks. Previous studies focus on two aspects of mortgage risks: default and prepayment. Mortgage default occurs when mortgage borrowers stop making scheduled payment and certain conditions required by law occur.<sup>9</sup> Prepayment occurs when borrowers pay off loans prematurely. From a lender perspective, prepayment can be considered a risk because when borrowers pay off the loan prematurely, often when interest rates fall, the expected stream of payment and return are not realized. Both default and prepayment can lead to a loss to lenders, although given the relative size of the loss, researchers and practitioners tend to focus more on default (Quercia and Stegman 1992).

Two complementary frameworks have been advanced to explain these two risks. One has focused on the financial benefit of options (Foster and Van Order 1984; Kau, Keenan, Muller, and Epperson 1992). This group of studies treats default and prepayment as financial options. The framework assumes that borrowers make constant evaluations about the financial benefits of these options and will exercise them once those options become beneficial. For instance, with regard to default, borrowers are expected to consider their equity position: borrowers who owe to the lender more than the house is worth, net of costs, are expected to be more likely to default than those with positive equity positions. This explanation, though powerful in explaining certain key aspects of mortgage performance, does not seem to explain fully why borrowers stop making their mortgage payments. Over the last two decades, a complementary view has emerged in which most borrowers are said to

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<sup>9</sup> In the United States, laws governing the conditions of default and foreclosure can differ by jurisdictions (See e.g. Cutts & Merrill, 2008).